

## **CLAIMS**

1           1.     A central vacuum unit comprising:  
2                 a housing;  
3                 a vacuum inlet;  
4                 a stale air outlet;  
5                 a fresh air inlet;  
6                 a fresh air outlet;  
7                 a vacuum fan for drawing dirt laden stale air through the vacuum inlet and out  
8 through the stale air outlet;  
9                 a fresh air fan for drawing fresh air through the fresh air inlet and out through  
10 the fresh air outlet;  
11                a waste collection chamber for collecting debris carried by the stale air entering  
12 the vacuum inlet; and  
13                a heat exchanger for transferring heat energy between the stale air and the fresh  
14 air.

1           2.     The central vacuum unit of claim 1 wherein the vacuum inlet is adapted to be  
2 connected to a cleaning implement.

1           3.     The central vacuum unit of claim 1 wherein the fresh air fan has a low speed  
2 mode and a high speed mode.

1           4.     The central vacuum unit of claim 1 further comprising an air filter in  
2 communication with at least one of the vacuum inlet and the fresh air inlet.

1           5.       The central vacuum unit of claim 1 further comprising a stale air inlet, and a  
2 stale air fan wherein the stale air fan draws stale air through the stale air inlet.

1           6.       The central vacuum unit of claim 1 further comprising a dividing wall  
2 separating the stale air from the fresh air.

1           7.       The central vacuum unit of claim 1, wherein the heat exchanger is a rotary air-  
2 to-air heat exchanger.

1           8.       The central vacuum unit of claims 1 further comprising a stale air inlet, wherein  
2 the vacuum fan functions also as a stale air fan and draws air through the stale air inlet and out  
3 through the stale air outlet.

1           9.       A central vacuum assembly comprising:  
2                   a vacuum cleaning apparatus;  
3                   a ventilation apparatus;  
4                   a heat exchanger for transferring heat energy between air in the vacuum  
5 cleaning apparatus and air in the ventilation apparatus; and  
6                   a fan for circulating air within at least one of the vacuum cleaning apparatus  
7 and the ventilation apparatus.

1           10.      The central vacuum unit of claim 9, wherein the heat exchanger is a rotary air-  
2 to-air heat exchanger.

1            11.     The central vacuum unit of claim 9 further comprising an air filter in  
2     communication with the air.

1            12.     The central vacuum unit of claim 9 wherein the fan operates at a first speed in a  
2     ventilation mode and the fan operates at a second speed in a vacuum mode, the second speed  
3     being higher than the first speed.

1            13.     A central vacuum unit comprising:  
2                     a housing;  
3                     a dividing wall within the housing defining a stale air chamber and a fresh air  
4     chamber;  
5                     a stale air inlet in the housing in communication with the stale air chamber for  
6     connection to an interior environment;  
7                     a vacuum inlet in the housing in communication with the stale air chamber for  
8     attachment to a cleaning device;  
9                     a stale air outlet in communication with the stale air chamber for connection to  
10    an exterior environment;  
11                    an exhaust filter within the stale air chamber separating the stale air outlet from  
12    the stale air inlet;  
13                    a vacuum filter within the housing for removing particulate matter from air  
14    drawn in through the vacuum inlet;  
15                    a stale air fan within the stale air chamber for drawing stale air through the stale  
16    air inlet, through the exhaust filter, and out through the stale air outlet;

17 a vacuum fan for drawing dirt laden air in through the vacuum inlet and  
18 through the vacuum filter;  
19 a fresh air inlet in communication with the fresh air chamber for connection to  
20 the exterior environment;  
21 a fresh air outlet in communication with the fresh air chamber for connection to  
22 the interior environment;  
23 a fresh air filter within the fresh air chamber separating the fresh air outlet from  
24 the fresh air inlet;  
25 a fresh air fan within the fresh air chamber for drawing fresh air through the  
26 fresh air inlet, through the fresh air filter, and out through the fresh air outlet;  
27 a waste collection chamber for collecting debris carried by the dirt laden air  
28 entering the vacuum inlet; and  
29 a rotary air-to-air heat exchanger extending into the stale air chamber and the  
30 fresh air chamber for transferring heat energy between the stale air and the fresh air.

1 14. The central vacuum unit of claim 13 wherein the stale air fan and fresh air fan  
2 operate at a first speed in a ventilation mode and the stale air fan and fresh air fan operate at a  
3 second speed in a vacuum mode, the second speed being higher than the first speed, and  
4 wherein in the vacuum mode the vacuum motor operates to create a vacuum to draw dirt  
5 laden air into the vacuum inlet.

1 15. The central vacuum unit of claim 13 further comprising:  
2 a ventilation motor for powering the stale air fan and the fresh air fan; and  
3 a vacuum motor for powering the vacuum fan.

1           16.    The central vacuum unit of claim 13 further comprising:  
2                   a ventilation motor for powering the fresh air fan; and  
3                   a vacuum motor for powering the vacuum fan and the stale air fan.

1           17.    A central vacuum cleaning system comprising:  
2                   a central vacuum unit comprising a vacuum cleaning apparatus, a ventilation  
3                   apparatus, a heat exchanger for transferring heat energy between air in the vacuum cleaning  
4                   apparatus and air in the ventilation apparatus, and a fan for circulating air within the central  
5                   vacuum unit;  
6                   a vacuum duct in fluid communication with a vacuum inlet of the vacuum  
7                   cleaning apparatus; and  
8                   a plurality of vacuum ports in fluid communication with the vacuum duct, the  
9                   plurality of vacuum ports being connectable to cleaning implements.

1           18.    The system of claim 17, wherein the fan operates at a first speed in a  
2                   ventilation mode and the fan operates at a second speed in a vacuum mode, the second speed  
3                   being higher than the first speed.

1           19.    The system of claim 17, wherein the ventilation apparatus is in fluid  
2                   communication with the vacuum cleaning apparatus.